

**DETERMINING CONNECTEDNESS AND OFFSET OF 3D OBJECTS  
RELATIVE TO AN INTERACTIVE SURFACE**

**Abstract of the Disclosure**

5       A position of a three-dimensional (3D) object relative to a display surface of  
an interactive display system is detected based upon the intensity of infrared (IR)  
light reflected from the object and received by an IR video camera disposed under the  
display surface. As the object approaches the display surface, a “hover” connected  
component is defined by pixels in the image produced by the IR video camera that  
10       have an intensity greater than a predefined hover threshold and are immediately  
adjacent to another pixel also having an intensity greater than the hover threshold.  
When the object contacts the display surface, a “touch” connected component is  
defined by pixels in the image having an intensity greater than a touch threshold,  
which is greater than the hover threshold. Connected components determined for an  
object at different heights above the surface are associated with a common label if  
15       their bounding areas overlap.